Frequently Asked Questions
FOOD FORTIFICATION

Does food fortification really have public health impacts?

A significant body of literature shows that industrial fortification can have public health impacts in high- as well as in low- and middle-income countries (LMIC). A recent analysis of 50 studies in LMIC has shown that fortification programmes with iodine, folic acid, vitamin A and iron have led to dramatic reductions in serious disease[1].

In the United States and Canada, fortified foods contribute a large proportion of the intakes of vitamins A, C, and D as well as thiamine, iron, and folic acid. Consequently, micronutrient deficiency illnesses - including rickets, neural tube defects and anaemia - have been greatly decreased.

The iodization of salt, which began in the 1920s, has virtually eliminated iodine deficiency and its effects (such as goitre and cretinism) on a global scale.

While nutrient-enriched crops are relatively new, results from over 16 years of research show that micronutrients in these crops are well absorbed, and can provide young children (1-6 years) and non-pregnant, non-breastfeeding women of reproductive age (WRA) (15-49 years) with up to 100, 80 and 70 percent of their daily average vitamin A, iron and zinc requirements. Nutrient-enriched crops improve micronutrient status and functional health outcomes, such as cognitive function and physical activity,

Why is food fortification necessary? Isn't dietary diversity sufficient?

It is difficult to meet nutrient needs across the lifecycle with an average diet. This is true in high-income countries, as well as in LMICs - especially for vulnerable groups such as people on a low income, young children, and pregnant and breastfeeding women. Micronutrient deficiencies are likely when the diet is largely plant source based, does not contain fortified foods, and around 70% of dietary energy comes from staples, such as wheat flour and rice. Studies show that in many countries a) staple food intake is substantially higher than recommended (around 70% vs 50% of energy, respectively), b) diets that could meet nutrient needs are not affordable for a substantial part of the population and, c) food fortification is a cost-effective way to meet micronutrient needs[3,4,5].

1. Emily C Keats, Lynnette M Neufeld, Greg S Garrett, Mduduzi N N Mbuya, Zulfiqar A Bhutta, Improved micronutrient status and health outcomes in low- and middle-income countries following large-scale fortification: evidence from a systematic review and meta-analysis, The American Journal of Clinical Nutrition, Volume 109, Issue 6, June 2019, Pages 1696–1708, https://doi.org/10.1093/ajcn/nqz023
2. Biofortification: A food systems solution to help end hidden hunger. HarvestPlus and FAO.
3. Deptford et al - https://sightandlife.org/wp-content/uploads/2018/12/11_SALMZ_0218_Research_04.pdf.
4. Solomons N. National food fortification: a dialogue with reference to Asia: balanced advocacy. Asia Pac J Clin Nutr. 2008;17 Suppl 1: 20–3.de Pee S. Nutrient needs and approaches to meeting them. In: de Pee S, Taren D, Bloem M, eds. Nutrition and health in a developing world. Cham, Switzerland: Humana Press; 2017:159–80
5. Saskia de Pee, Diego Moretti, Cecilia Fabrizio. Standards and Specifications for Fortified Rice in Scaling Up Rice Fortification in West Africa. Sight and Life and World Food Programme. December 2018.

Does fortification change the appearance or the taste of food?

A lot of work has been done to ensure that fortified foods look and taste the same as unfortified food. For example, appropriately fortified rice is indistinguishable from natural rice in appearance, taste and texture. Global recommendations for flour fortification are based on levels that will not affect the flour's taste, smell, or appearance.

How much does fortification cost? Isn't it expensive?

The cost of fortification depends on a number of factors including the vitamins and minerals included in the premix. However, the overall cost per person per year is low, ranging from as little as $0.05 for iodized salt to $0.12 for wheat and maize fortified with iron and folic acid. Lifetime costs for these two fortified commodities are less than $15 per person[6].

Are nutrient-enriched crops cost-effective?

Nutrient-enriched crops don't cost more than regular crops, nor do they need more water or fertilizer. In 2008, the Copenhagen Consensus (a panel of the world's leading economists) estimated the health benefit-to-cost ratio of nutrient-enriched crops as $17 of benefits for every $1 invested. Once a micronutrient is bred into a crop line, that trait remains. Over time, this makes nutrient-enriched crops sustainable as well as cost-effective[7].

Can a person consume an excess of nutrients from fortified foods?

This is highly unlikely. The nutrient composition is set based on the average per capita consumption of the fortified product, with ample safety margins to ensure that overdosing does not occur. Taking rice as an example, at common fortification levels, a person would have to eat more than two kilograms of uncooked, fortified rice per day over a prolonged period of time to consume an excess of nutrients.

Studies and research in countries with long histories of fortification have established overwhelming evidence that fortified foods are safe. A study published in 2004 found that excessive micronutrient intake in European diets was non-existent, even for consumers choosing higher amounts of fortified foods . In the United States, where most wheat flour and many breakfast cereals are fortified with folic acid, and vitamin supplements are also widely consumed, a population-based study found that less than 3% of U.S. adults exceeded the recommended upper level of folic acid. None reached that level by eating fortified foods; they only exceeded the level if they consumed high-dose supplements[9].

Are nutrient-enriched crops developed through genetic modification (GM)?

Nutrient-enriched crops are developed through agricultural practices or conventional plant breeding techniques. This method does not involve genetic modification.

6. Greg S. Garrett, Dipika Matthias, Emily Keats, Mduduzi Mbuya, Eric Wouabe. Doubling down on food fortification to fortify the future. https://www.gatesfoundation.org/TheOptimist/Articles/food%20fortification%20to%20fortify%20the%20future). The Optimist. The Bill and Melinda Gates Foundation. Accessed on 15 November 2019.
7. Harvest Plus. https://www.harvestplus.org/about/faqs. Accessed on 15 November 2019.
8. Fletcher RJ1, Bell IP, Lambert JP. Public health aspects of food fortification: a question of balance. Proc Nutr Soc. 2004 Nov;63(4):605-14. https://www.ncbi.nlm.nih.gov/pubmed/15831133.